

IN THE CLAIMS:

Claims 1-12 (Canceled)

--13. (Currently Amended) A wireless communication system comprising:
a number of actuators each having one or more antenna associated therewith and being
adaptable to be located on or within an element and being adaptable for causing said element to
deform in a desired manner when actuated; and
control transceiver means, operable to communicate in a wireless manner with said
number of actuators, for supplying a modulated command signal to at least one antenna;
whereby, in response to said modulated command signal, material characteristics of the
respective actuator or actuators cause said modulated command signal to be demodulated without
the use of any active electronic devices, whereupon and said element is enabled to achieve the
desired deformation;
~~wherein said control transceiver means communicates with the actuator or actuators over~~
~~a microwave frequency range...~~

Claims 14-18 (canceled)

--19. (Currently Amended) ~~A~~ The wireless communication system according to claim 13,
comprising:
~~a number of actuators each having one or more antenna associated therewith and being~~

~~adaptable to be located on or within an element and being adaptable for causing said element to deform in a desired manner when actuated, and~~

~~control transceiver means, operable to communicate in a wireless manner with said number of actuators, for supplying a modulated command signal to at least one antenna;~~

~~whereby, in response to said modulated command signal, material characteristics of the respective actuator or actuators cause said modulated command signal to be demodulated and said element to achieve the desired deformation;~~

~~wherein each said antenna is a micro-strip type antenna.--~~

Claims 20-24 (Canceled)

--25. (Currently Amended) A system for monitoring and/or deforming a structure in a desired manner, said system comprising:

a number of devices each including at least one of a sensor and an actuator each having one or more antenna associated therewith and being adaptable to be located on or within said structure, in which each said sensor is adaptable for monitoring at least one predetermined characteristic of said structure and each said actuator is adaptable for causing said structure to deform in said desired manner when actuated; and

control means for transmitting a command signal to at least one antenna in a wireless manner;

whereby, in response to said command signal, (i) the respective sensor or sensors and the at least one antenna associated therewith generate by use of electromagnetic coupling

therebetween a characteristic signal indicative of a detected respective characteristic or characteristics and modulate the same without the use of any active electronic devices so as to obtain an output signal and transmit said output signal and (ii) the respective actuator or actuators cause said structure to deform in said desired manner;

wherein said control means communicates with each said device over a microwave frequency range.--

--26. (Currently Amended) ~~A~~ The system according to claim 25, for monitoring and/or deforming a structure in a desired manner, said system comprising:

~~a number of devices each including at least one of a sensor and an actuator each having one or more antenna associated therewith and being adaptable to be located on or within said structure, in which each said sensor is adaptable for monitoring at least one predetermined characteristic of said structure and each said actuator is adaptable for causing said structure to deform in said desired manner when actuated, and~~

~~control means for transmitting a command signal to at least one antenna in a wireless manner,~~

~~whereby, in response to said command signal, (i) the respective sensor or sensors and the at least one antenna associated therewith generate by use of electromagnetic coupling therebetween a characteristic signal indicative of a detected respective characteristic or characteristics and modulate the same so as to obtain an output signal and transmit said output signal and (ii) the respective actuator or actuators cause said structure to deform in said desired manner;~~

wherein each said antenna is a micro-strip type antenna.--

Claim 27 (Cancelled)

--28. (Currently Amended) A system for causing a structure to be deformed in a desired manner, said system comprising:

a number of sensors each having one or more micro-strip type antenna associated therewith and being adaptable to be located on or within said structure and being adaptable for measuring at least one predetermined characteristic of said structure without the use of any active electronic devices;

a number of actuators each having one or more micro-strip type antenna associated therewith and being adaptable to be located on or within said structure and being adaptable for causing said structure to deform in said desired manner when actuated;

control means for transmitting a microwave signal in a wireless manner to a desired number of said sensors, wherein, in response thereto, the respective sensor or sensors and the at least one antenna associated therewith generate by use of electromagnetic coupling therebetween

a characteristic signal indicative of a detected respective characteristic or characteristics; and

means for processing each said characteristic signal and for supplying each processed signal to appropriate one or ones of the actuators so as to actuate the same and cause said structure to deform in said desired manner.--

--29. (Previously Presented) A system as in claim 28, wherein said control means

includes transceiver means for communicating in a wireless manner with each sensor and actuator.--

--30. (Previously Presented) A system as in claim 29, wherein said transceiver means communicates with each said sensor and said actuator over a microwave frequency range.--

--31. (Previously Presented) A system as in claim 28, wherein the processing means is located on or within said structure.--

--32. (Previously Presented) A system as in claim 28, wherein the processing means is not located on or within said structure and wherein said processing means transmits each said processed signal to the appropriate one or ones of the actuators in a wireless manner.--

--33. (Previously Presented) A system as in claim 28, wherein at least one of said number of sensors and said number of actuators includes only passive electronic devices.--

--34. (Previously Presented) A system as in claim 28, wherein at least one of said number of sensors and said number of actuators includes a substrate portion having non-linear material characteristics.--

--35. (Previously Presented) A system as in claim 34, wherein said substrate portion is a piezoelectric ceramic material.--

--36. (Previously Presented) A system as in claim 28, wherein the at least one predetermined characteristic includes at least one of strain, acceleration, deformation, and pressure.--

--37. (Previously Presented) An element for use in a system for monitoring and/or deforming a structure in a desired manner, said element having at least one antenna associated therewith and being adaptable to be located on or within said structure and being adaptable to operate as at least one of a sensor device and an actuator device, in which said element monitors at least one predetermined characteristic of said structure when operating as a sensor device and in which said element causes said structure to deform in said desired manner when operating as an actuator, and, in which a signal is transmitted to said element in a wireless manner so as to activate the antenna thereof and enable said element to monitor the at least one predetermined characteristic of said structure when operating as a sensor device and enable said element to cause said structure to deform in said desired manner when operating as an actuator, wherein said element is adaptable to operate simultaneously as a sensor device and an actuator device,
wherein the antenna is a micro-strip type antenna and wherein said element includes a grating layer.--

Claims 38-39 (Canceled)

--40. (Previously Presented) An element as in claim 37, wherein said element includes only passive electronic devices.--

--41. (Previously Presented) An element as in claim 37, further having a protective cover layer and a substrate having a slot and a feedline.--

--42. (Previously Presented) A system as in claim 26, wherein at least one of said number of devices includes a protective cover layer and a substrate having a slot and a feedline.--

--43. (Previously Presented) A system as in claim 28, wherein at least one of said number of sensors and said number of actuators includes a protective cover layer and a substrate having a slot and a feedline.--

Claims 44-48 (Cancelled)

--49. (Previously Presented) An element for use in a system for monitoring and/or deforming a structure in a desired manner, said element having at least one antenna associated therewith and being adaptable to be located on or within said structure and being adaptable to operate as at least one of a sensor device and an actuator device, in which said element monitors at least one predetermined characteristic of said structure when operating as a sensor device and in which said element causes said structure to deform in said desired manner when operating as an actuator, and, in which said element is operable to receive a signal transmitted thereto in a

wireless manner to activate the antenna thereof and enable said element to monitor the at least one predetermined characteristic of said structure when operating as a sensor device and enable said element to cause said structure to deform in said desired manner when operating as an actuator, wherein the antenna is a micro-strip type antenna and wherein said element includes a grating layer.--

--50. (Previously Presented) A system as in claim 28, wherein the non-linear material characteristics of the substrate portion causes modulation or demodulation of the received signal from the RF signal.—

--51. (New) The wireless communication system according to claim 13, wherein said control transceiver means communicates with the actuator or actuators over a microwave frequency range.

--52. (New) The system according to claim 25, wherein said control means communicates with each said device over a microwave frequency range.

--53. (New) A wireless communication system comprising:
a number of sensors each having an antenna and being located on or within an element, each sensor being adaptable to detect at least one respective predetermined characteristic of said element; and
control transceiver means, operable to communicate in a wireless manner with said

number of sensors, for supplying a signal to a desired number of said sensors so as to activate each respective antenna thereof,

wherein, in response to the received signal, the desired number of sensors are enabled to detect the respective at least one predetermined characteristic and, due to material characteristics thereof, to cause a modulated output signal to be transmitted therefrom without the use of any active electronic devices indicative of the detected respective at least one characteristic to said control transceiver means.—

--54. (New) The wireless communication system as in claim 53, wherein one or more of said number of sensors includes only passive electronic devices.—

--55. (New) The wireless communication system as in claim 53, wherein one or more of said number of sensors includes a substrate portion having non-linear material characteristics.—

56. (New) The wireless communication system as in claim 55, wherein said substrate portion is a piezoelectric ceramic material.

--57. (New) The wireless communication system as in claim 53, wherein the at least one predetermined characteristic includes one or more of the following items: strain, acceleration, deformation, and pressure.--

--58. (New) The wireless communication system as in claim 53, wherein said control

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transceiver means communicates with each said sensor over a microwave frequency range.--